BLACKFOOT CHALLENGE WEEKLY IRRIGATION REPORT

Friday July 15, 2022

Blackfoot watershed croplands had little or no rain this week and mostly sunny skies. Next week will be sunny again with very warm temperatures. Hay crops are looking like some of the best first cuttings ever and should put smiles on many faces. Soil moisture fell about 1½ inches this week unless irrigated. Crop water use remains lower than last year and will be slightly higher next week except in fields harvested for hay. Streamflows are dropping fast across the watershed.

SOME MORE GOOD HAYING WEATHER

Only a few scattered locations had small rainstorms this week as sunny skies dominated the weather. Next week looks like more good haying weather and this may be a record first cutting. High temperatures will be in the upper 80s with lows in the 40s and 50s. The 30-day forecast says average rainfall and temperatures. The 90-day forecast says below average rainfall and above average temperatures.

Your own rain gauge is your best source of rainfall information.

CROP WATER USE – ABOUT AVERAGE FOR THIS TIME OF YEAR

This week crop water use was above average for this time this year and should be slightly higher next week due to hotter temperatures and abundant sunshine. Crops will use 1½ inches to almost 2 inches of soil moisture next week (see chart below). Crop water use is reduced by 2/3 the first week after cutting hay and by 1/3 the second week. Reduce the figures below by these amounts.

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS TOTAL[1]	NEXT 7 DAYS DAILY AVE[2]	SEASON TOTAL[3]
HAY CROPS	**1.6**	**1.7**	.24	**13.3**
PASTURE	**1.3**	**1.4**	.20	**11.3**
SPRING GRAINS	**1.7**	**1.8**	.26	**10.4**
WINTER WHEAT	**1.3**	**1.0**	.14	**13.8**
LAWNS	**1.5**	**1.6**	.21	**12.8**

[1]Expected water use over the next week (range if weather becomes cooler or hotter than expected)
[2]Expected average daily water use over the next week (compare this with your soil moisture content)
[3]Beginning April 1 – note in 2010-13 we started our seasonal total on May 1 but since include April

SOIL MOISTURE– DROPS OVER 1½ INCHES UNLESS IRRIGATED OR CUT

Soil moisture dropped by about 1½ inches this week unless irrigated. Soil moisture will drop over 1½ inches next week without irrigation so continue to check your soil moisture and refill with at least as much as the weekly crop water use. Boost soil moisture before hay cutting and as soon as you can after to prevent crop damage. Remember that crop water use drops by 2/3 the week after cutting and by 1/3 the second week after cutting. This is a good time to replenish soil moisture while crop water use is reduced and there is less foliage to catch and evaporate water.

The table on Page 1 provides a quick summary of crop water use this last week and an estimate for next week. The table and chart below summarize the entire irrigation season and compare it with average, hot and cool conditions so you can plan ahead. This table and chart will be updated weekly all season.

BLACKFOOT 2022 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE (INCHES OF WATER)

	RAIN[1]	2022 WEEKLY POTENTIAL CROP WATER USE[2]						AVERAGE WEEKLY CROP WATER USE[3]		
WEEK ENDING	RAIN	HAY CROPS[4]	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
APRIL	1.25	1.00	1.00	0.00	0.00	1.00	1.00			
5/6/2022	0.25	0.70	0.60	0.10	0.00	0.80	0.80	0.70	1.00	0.40
5/13/2022	0.01	0.80	0.70	0.20	0.00	0.90	0.90	0.80	1.10	0.60
5/20/2022	0.10	0.90	0.80	0.40	0.20	1.00	0.90	0.90	1.20	0.70
5/27/2022	0.20	0.90	0.80	0.70	0.50	1.00	0.90	1.00	1.30	0.70
6/3/2022	0.10	1.00	0.80	0.80	0.60	1.10	0.90	1.10	1.50	0.80
6/10/2022	0.50	1.00	0.80	0.90	0.70	1.10	0.90	1.20	1.70	0.80
6/17/2022	0.75	1.00	0.80	1.10	0.90	1.10	0.90	1.25	1.90	0.90
6/24/2022	1.00	1.30	1.10	1.30	1.20	1.30	1.20	1.30	2.00	1.00
7/1/2022	0.01	1.70	1.40	1.60	1.70	1.70	1.60	1.40	2.00	1.00
7/8/2022	0.75	1.40	1.20	1.60	1.60	1.50	1.30	1.60	2.10	1.10
7/15/2022	0.01	1.60	1.30	1.70	1.70	1.30	1.50	1.65	2.20	1.10
7/22/2022								1.70	2.20	1.10
7/29/2022								1.70	2.00	1.10
8/5/2022								1.50	1.80	1.00
8/12/2022								1.40	1.70	1.00
8/19/2022								1.30	1.60	0.90
8/26/2022								1.20	1.40	0.90
9/2/2022								1.15	1.40	0.70
9/9/2022								1.00	1.30	0.60
9/16/2022								0.90	1.20	0.50
9/23/2022								0.80	1.10	0.50
9/30/2022								0.70	1.00	0.40
TOTAL	3.68	13.30	11.30	10.40	9.10	13.80	12.80	26.25	34.70	17.80

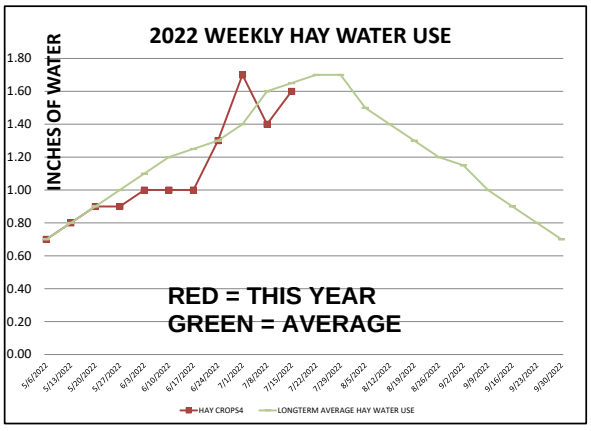
[1] Rainfall should be reduced to account for immediate evaporation from crop and soil surfaces (0.1-April,May and Sept, 0.15-June and August, 0.2-July) (This rainfall figure is an average across all Blackfoot croplands - use your own rain gauge for better accuracy)

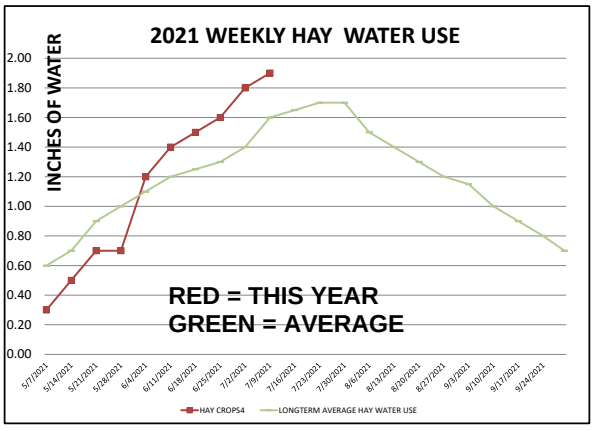
[2] **This years** maximum water use by healthy crops that are well-fertilized and irrigated, disease and insect-free. Will vary slightly across the drainage.

[3] **Longterm average** water use for each crop each week based on long-term historic data.

[4] Hay Crop water use drops approximately 2/3 the first week after cutting, 1/2 the second and 1/3 the third.

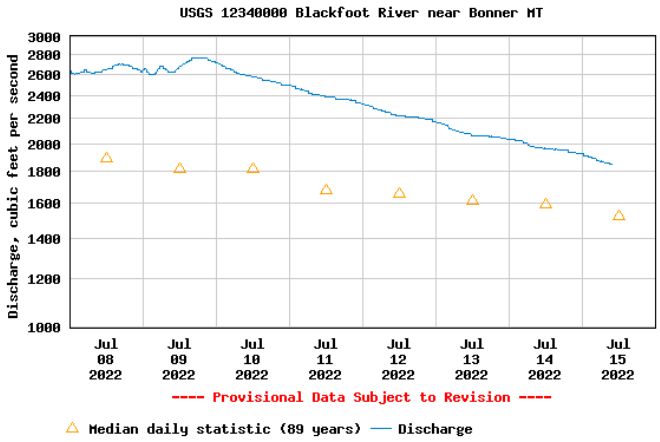
Crop Water Use Continues to be Lower Than Last Year





STREAMFLOW

The Blackfoot river flow at Bonner remains above average and will likely stay that way as irrigators shut down for hay harvest. Flows dropped almost 1000 CFS this week. Todays flow is **1,850 CFS** which is above average for this date (1,740 CFS). 1899 saw the highest flow at 6,410 CFS while the lowest flow was 532 CFS in 1977. Blackfoot river flows are still predicted to be about normal for the rest of this season.

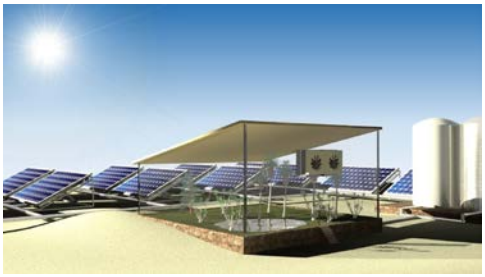


SOLAR POWERED PIVOTS MAY BE IN YOUR FUTURE

Valley Irrigation Company is one of the worlds leading manufacturers of center pivot irrigation systems. Their latest attempts to improve irrigation and energy options include pivots run on solar power. Solar panels provide electricity to pump water and move the pivot when the sun shines while using conventional electric sources from the grid during cloudy periods. Since these sytems are connected to the traditional electric grid, irrigators can sell excess energy from their solar panels back to the grid when not using it for irrigation. Valley has over 700 of these solar pivot installations worldwide and is starting to market them in the United States.

SOLAR POWER PRODUCES WATER FROM THIN AIR!

Researchers in the mid-east are using solar power to produce water as well as electricity for future uses in agriculture. This technology can extract water from the air, even in dry climates. It may be a while before we need to go this route for Blackfoot watershed hayfields but its great to know it could be a future option. It will likely be a while before we produce enough water from this method for a hay crop but someday our electricity and water could both come from solar panels in the back forty. No doubt this technology will provide a whole new specialty for water rights lawyers.



For further information contact Jennifer Schoonen, Blackfoot Challenge Water Steward, 406-360-6445 or Barry Dutton, Professional Soil Scientist, 406-240-7798 barry@landandwaterconsulting.net

THE BLACKFOOT WATERSHED IRRIGATION SEASON IN BRIEF

This is a summary of general activities and recommendations for the whole season (more detail in the irrigation guide).

APRIL – GET READY AND PLAN YOUR IRRIGATION STRATEGY!

- Get your irrigation system ready – perform maintenance and test system.
- Evaluate soil moisture conditions and weather predictions then plan for irrigation and drought if needed.

MAY – CHECK SOIL MOISTURE & BE READY FOR UNUSUAL HEAT OR COLD!

- Check the soil moisture content at the start of growing season and fill up the soil to its water holding capacity during early irrigations (2-4 inches).
- Watch for dry soil conditions, especially with new plantings and apply water to ensure good germination and emergence.
- Irrigate deeply at least once early in the season to promote deep root growth.
- Apply 2-5 inches of irrigation to hay and pasture crops in May depending on weather. Apply 0-2 inches to spring grains and new plantings as needed based on weather and growth. Apply extra water to fill up the soil (2-4 in).

JUNE – THIS IS THE TIME TO MAKE YOUR BIGGEST EFFORT SO POUR IT ON!

- Apply 6-8 inches of irrigation in June to hay and pasture crops and winter wheat depending on weather. Apply 5-8 inches to spring grains and new plantings as needed based on weather and growth.
- Consider irrigating deeply to fill up soil root zone and promote deep root growth.
- Be sure small grains are irrigated well during their critical periods of boot, bloom and early heading.

JULY – POUR IT ON UNTIL HARVEST AND RETURN QUICKLY

- Apply 1 - 2 ½ inches of irrigation per week in July to all crops - depending on weather.
- Cutting is a critical stress period for hay crops, especially alfalfa so irrigate deeply to fill up the root zone before cutting then get back across the field quickly after cutting. Crop water use declines when hay is cut so this is a good opportunity to fill up the soil again. Irrigate at least once after cutting. Small grains harvested for seed are usually irrigated up to the milk to soft dough stage but be sure soil moisture remains to prevent kernel shriveling. Small grains for forage are often harvested earlier when plants are less dry and seeds soft.

AUGUST- KEEP IRRIGATING SMALL GRAINS UNTIL KERNELS MATURE, BE DROUGHT AWARE!

- Apply 1 - 2 inches of irrigation per week in August to hay and pasture crops for full production depending on weather. Irrigate new plantings as needed.
- Many folks irrigate for pasture following their one hay cutting. Irrigate according to how much pasture you seek and with consideration for other water needs in the watershed, especially in drought years.
- Reduce river withdrawals by rotating systems and reducing the amount of irrigation at one time. Stop irrigating if you can.

SEPTEMBER – APPLY AS NEEDED/AVAILABLE & GET READY FOR SPRING!

- Apply ½ - 1 ½ inches of irrigation per week in September to hay and pasture crops for full production depending on weather. Irrigate new plantings as needed. Prepare the system for winter and an early start next spring.